R&S®EVS300
ILS/VOR Analyzer
Precision level and modulation analysis for ground and flight inspection

ROHDE&SCHWARZ

Test & Measurement

Product Brochure | 05.00

R&S®EVS300 ILS/VOR Analyzer

At a glance

The R&S®EVS300 is a portable level and modulation analyzer designed especially for starting up, checking and maintaining ILS, VOR and marker beacon systems. The integrated rechargeable battery and robust design make it the ideal choice for mobile, mains-independent measurements in the field. Due to the high measurement speed and the trigger/synchronization functions, the R&S®EVS300 is also tailor-made for deployment with flight inspection systems.

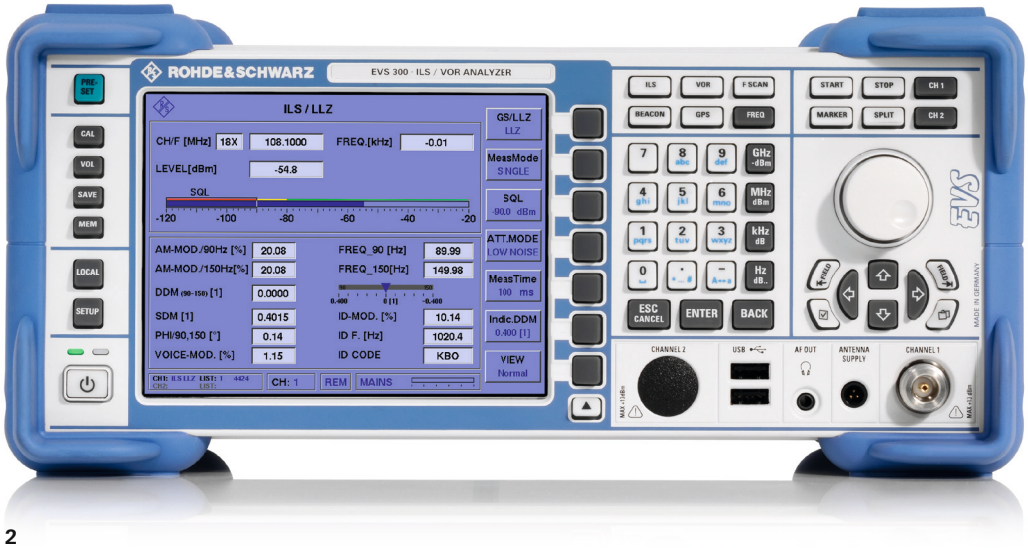
The R&S®EVS300 is the first test receiver for ILS/VOR signals that meets the demands of ground measurements and flight inspection systems. This permits the direct correlation of ground- and air-based signal analysis as recommended in ICAO 8071.

For the user, an extensive selection of software options simplifies regular measurement tasks. FFT, frequency scan and oscilloscope options make it possible to analyze signals in the frequency and time domain without carrying along extra test and measurement equipment. The integrated data logger provides enough memory to continuously record all signal parameters. The results can be graphically presented directly on the large color display of the R&S®EVS300.

During flight inspection, the optional second signal processing channel of the R&S®EVS300 permits the simultaneous measurement of localizer and glideslope signals at continuously high rates. When equipped with the GPS option, the R&S®EVS300 also stores the (D)GPS position with each ILS/VOR/MB measurement at the time it was taken.

Key facts

- Extremely fast (100 measurements per second)
- Synchronization via GPS, trigger and remote interfaces
- Digital separation of course and clearance signals using only one signal processing channel (R&S®EVS-K3 option)
- Expandable to support a second signal processing channel for simultaneous localizer and glideslope measurements (R&S®EVS-B1 option)
- Support for R&S®NRP-Zxx and R&S®NRT-Zxx power sensors (R&S®EVS-K5 option)
- Measurement of GBAS and SCAT systems (R&S®EVS-K9 and R&S®EVS-K10 options)



Front view.

R&S®EVS300 ILS/VOR Analyzer

Benefits and key features

Unique measurement functions for ground tests and flight inspection systems

- Precision modulation analysis in realtime
- Level measurements with pinpoint accuracy by means of internal calibration generator
- Outstanding input sensitivity
- Particularly high measurement speed
- Simultaneous analysis of course and clearance signals (R&S®EVS-K3 option)
- Simultaneous measurement of glideslope and localizer signals via second processing channel
- Integrated data logger for recording and immediately viewing measurement results
- Extensive trigger and synchronization functions
- AF signal analysis via baseband input

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Expanded functionality through software and hardware options

- RF spectrum analysis (R&S®EVS-K1 option)
- GPS-based measurements (R&S®EVS-K2 option)
- Digital separation of course and clearance signals using only one signal processing channel (R&S®EVS-K3 option)
- FFT baseband analysis (R&S®EVS-K4 option)
- Support for Rohde&Schwarz power sensors (R&S®EVS-K5 option)
- Checking of pulses and timing in DME systems (R&S®EVS-K6 option)
- Time domain analysis with oscilloscope mode (R&S®EVS-K7 option)
- Testing of ground-based augmentation systems (GBAS, SCAT) for satellite navigation (R&S®EVS-K9 and R&S®EVS-K10 options)

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User-friendly design and application-specific extras

- Stationary or mobile operation over a wide temperature range
- Intuitive graphical user interface
- Simple remote control operation via standard interfaces
- Compact, lightweight and robust
- Weather and transit protection for mobile operation
- ILS/VOR test antenna with carrying bag
- Accessories for conducting measurements in test vehicles or flight inspection aircraft

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REPLACE ONLY WITH ORIGINAL BATTERY-PACK
ORDER No.: 1102.5607.00
NIMH 13.2 V 7.6 Ah
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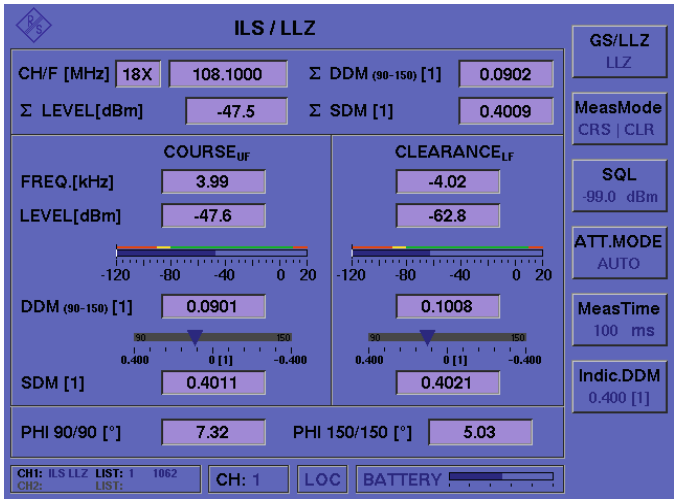
GPS / GSM RS 232-2
BASEBAND IN TRIGGER IN
ANALOG 1 50Ω OUT
ANALOG 2 50Ω OUT
AUX POWER 12 V DC OUT

Rear view.

Unique measurement functions for ground tests and flight inspection systems

Simultaneous analysis of course and clearance signals.



Precision modulation analysis in realtime

By using pure digital signal processing, the R&S®EVS300 offers outstanding accuracy when analyzing signal levels and modulation. The input signal is sampled at the IF with a highly accurate 16-bit analog-digital converter. This eliminates the otherwise typical IF crystal filter, which is a major source of ripple and temperature drift.

Level measurements with pinpoint accuracy by means of internal calibration generator

The R&S®EVS300 ensures extremely accurate level measurements by using automatic calibration. The integrated calibration generator that is used for this purpose features exceptionally high long-term stability.

The R&S®EVS300 also boasts a very wide dynamic range that is achieved by means of switchable preamplifiers and switchable attenuator pads in combination with a high-level mixer.

With its large input level range, optimized preselector filter and innovative housing shielding, the R&S®EVS300 can even be used in close proximity to transmit antennas, an especially important feature for ATC communications on adjacent VHF channels.

Outstanding input sensitivity

Due to its extremely low noise figure, the R&S®EVS300 features particularly high input sensitivity. This makes it possible to carry out highly accurate ILS analyses and VOR station measurements even over long distances.

Particularly high measurement speed prevents subsampling

The R&S®EVS300 offers the highest measurement speed of any analyzer on the market. With up to 100 measurements per second, ILS signals can be detected with high temporal resolution for applications such as flight inspections or runway measurements. This allows the accurate measurement and analysis of effects such as scallops or bends.

Simultaneous analysis of course and clearance signals (R&S®EVS-K3 option)

The R&S®EVS-K3 option enables users to measure both carriers of a two-frequency ILS system separately or simultaneously. The level ratio and phase relationship between the course and clearance signals can be precisely measured while the ILS system is in the normal mode of operation.

Simultaneous measurement of glideslope and localizer signals via second processing channel

Despite its compact size, the R&S®EVS300 can be equipped with an optional, second signal processing channel (R&S®EVS-B1 option). With this enhancement, users can simultaneously carry out two independent measurements on different frequencies. This capability is vital in flight inspection systems because the localizer and glideslope signals must be measured at the same time. An additional application required in flight inspection systems is the parallel measurement of two different VOR stations.

Integrated data logger for recording and immediately viewing measurement results

The R&S®EVS300 features a large internal memory for storing data. Even at the highest speed of 100 measurements per second, it can store all the parameters that have been measured.

The user can store the measurement results in individual lists (for ILS, VOR and MB). The visualization function of the R&S®EVS300 permits the fast and easy graphical display of important parameters. During or after a runway measurement for example, the user can view the DDM, SDM and level values directly on the screen of the R&S®EVS300. Special processing or formatting of the results is not required.

Independent of the direct visualization feature, the R&S®EVS300 also offers the capability to transfer the content of the data logger to a PC by means of a USB stick or via Ethernet.

Extensive trigger and synchronization functions

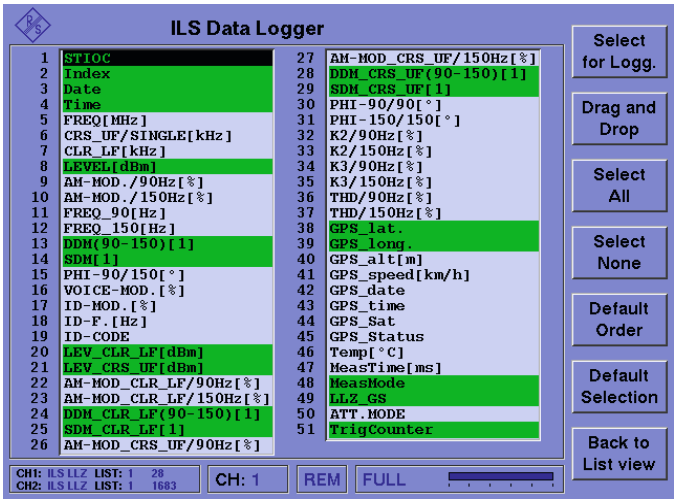
For installation of the R&S®EVS300 in a test vehicle or a flight inspection system, a trigger input is available for synchronization purposes. The behavior of the trigger can be individually configured in the device setup.

AF signal analysis via baseband input

The R&S®EVS300 baseband input is ideal for testing ILS or VOR baseband signals, making it easier to localize potential errors.

All of the R&S®EVS300 analysis functions can be used for AF signals without any restrictions.

Selection of parameters stored in the data logger (example ILS mode).



Expanded functionality through software and hardware options

RF spectrum analysis (R&S®EVS-K1 option)

When equipped with the R&S®EVS-K1 option, the R&S®EVS300 is capable of displaying the RF spectrum of the input signal in the range from 70 MHz to 350 MHz. Clear/write, average and peak hold trace modes as well as markers and delta markers are selectable. The large dynamic range of up to 100 dB in combination with the low noise figure make the R&S®EVS300 ideal for analyzing spurious signals in the ILS/VOR and communications bands.

GPS-based measurements (R&S®EVS-K2 option)

The R&S®EVS-K2 option makes it possible to connect external (D)GPS receivers to the second RS-232 serial interface on the R&S®EVS300. NMEA and Ashtech protocols are supported.

The R&S®EVS300 automatically links the ILS/VOR/MB measurement results to the GPS positioning data and time stamps that have been stored, and merges them into a data set. These data sets are either output via the remote interfaces or stored in the internal data logger of the R&S®EVS300.

The R&S®EVS-K2 GPS option expands the R&S®EVS300 to a standalone test and measurement system. Connection to a (D)GPS receiver is all that is required to correlate the position and measurement values when taking measurements in the field. Additional equipment or external software is not required.

FFT baseband analysis (R&S®EVS-K4 option)

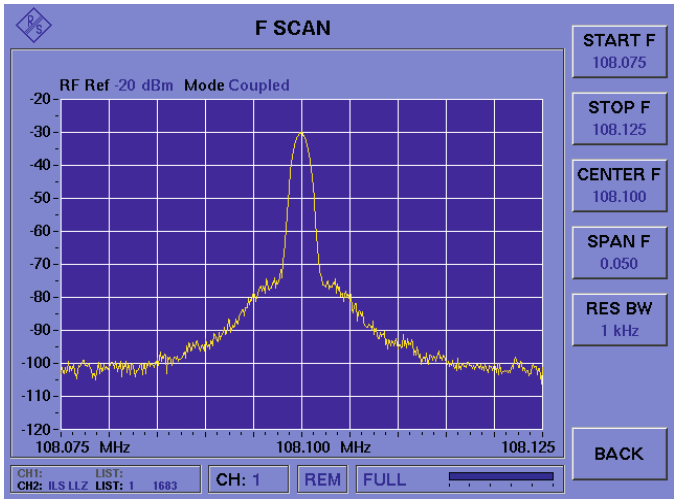
The R&S®EVS-K4 option enables the R&S®EVS300 to perform a fast Fourier transformation (FFT) of the demodulated RF signal or the signal supplied to the baseband input. Using this method, harmonics and intermodulation products from ILS, VOR and marker beacon signals can be analyzed. In addition to displaying the spectrum in logarithmic or linear form, various window functions such as Hann and flat top can be selected. Marker and delta marker functions make it easy to read the levels and frequencies.

Support for Rohde&Schwarz power sensors (R&S®EVS-K5 option)

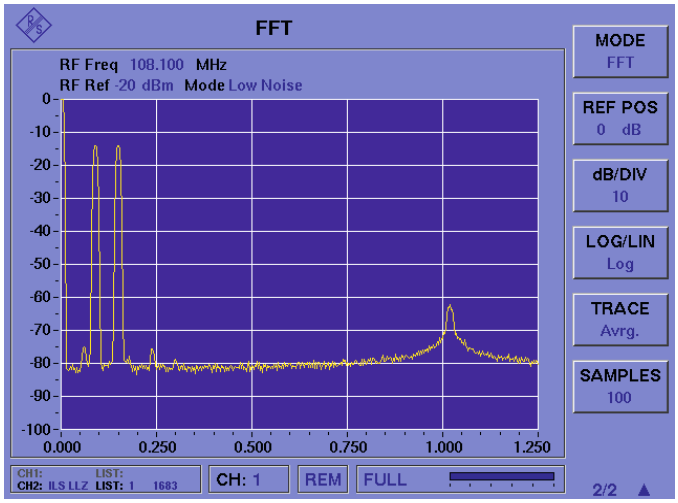
The R&S®EVS-K5 permits the connection of R&S®NRP-Zxx and R&S®NRT-Zxx power sensors to the USB or RS-232 interface on the R&S®EVS300. These power sensors are extremely well suited for the startup and maintenance of transmitters, particularly when in the field.

The R&S®EVS300 displays values such as peak power and average power. If R&S®NRT-Zxx power sensors are connected, VSWR is also shown. The need to carry along an additional base unit or laptop computer is eliminated.

Spectrum analysis of the RF signal.



FFT analysis for displaying the spectrum of the demodulated signal.



Checking of pulses and timing in DME systems (R&S®EVS-K6 option)

In accordance with the recommendations of ICAO, measurements such as pulse shape, pulse spacing, peak power output, peak variation and time delay must be checked on a regular basis.

To meet this need, the R&S®EVS-K6 option, combined with an R&S®NRP-Z81 wideband power sensor, provides a graphical display of the pulsed DME signal. Values such as rise and fall times can be automatically displayed. In addition, the main delay is measured via the trigger input of the R&S®NRP-Z3 USB adapter. The measured pulse can be stored for comparison purposes and subsequently archived.

Time domain analysis with oscilloscope mode (R&S®EVS-K7 option)

The R&S®EVS-K7 option enables tasks such as the simple verification of CSB and SBO signals from ILS transmitters. The cursor function in oscilloscope mode makes it easy to reliably detect phase and level errors.

Furthermore, the fine graphical resolution and high vertical A/D converter resolution of the R&S®EVS300 make it possible to detect even small signal distortions.

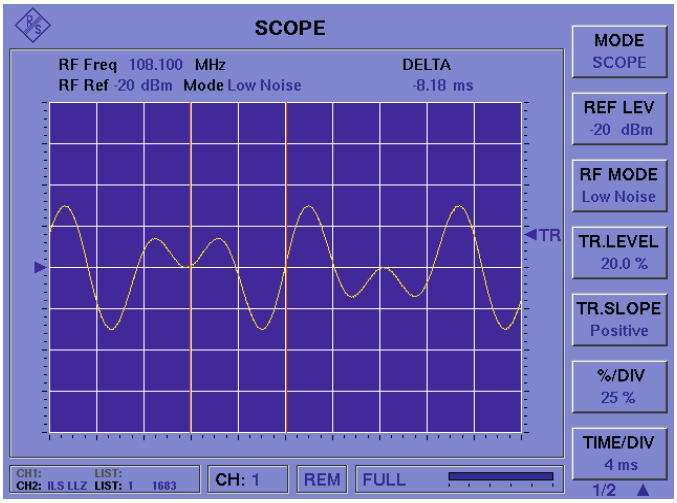
Testing of ground-based augmentation systems (GBAS, SCAT) for satellite navigation (R&S®EVS-K9 and R&S®EVS-K10 options)

The R&S®EVS-K9 and R&S®EVS-K10 software options make it possible to test the VHF data link (VDL) of GBAS and SCAT ground-based satellite navigation systems. The content of all GBAS/SCAT timeslots (A to H) is analyzed and synchronized using an external GPS receiver (1 pps signal). For each timeslot, the instrument lists the main parameters (slot and station ID, transmission length, message ID, FEC and repetition rate) along with the frequency offset and level measured for the signal under test. In the slot view, operators can visualize the individual messages (up to eight) carried in a specific slot, together with the message type and message length.

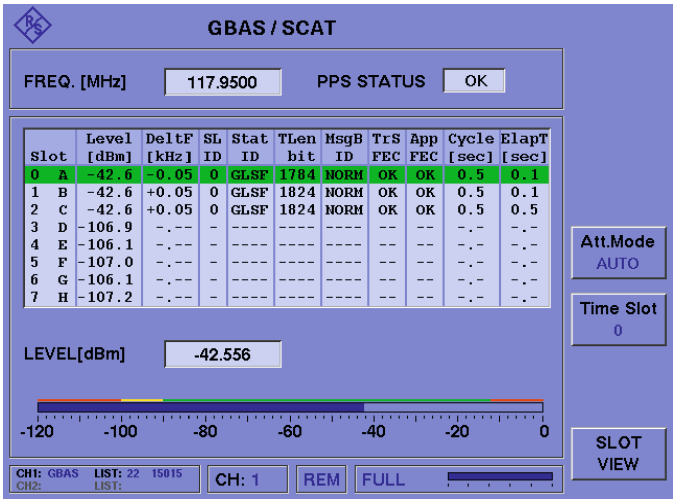
For both GBAS and SCAT signals, the instrument delivers a detailed analysis of type 1 messages, which contain the GPS correction data (satellite information and pseudorange corrections) for the multimode receivers on board the aircraft, as well as of type 4 messages, which contain, in their final approach segment data block (FASDB), all the data required to provide precision approach and landing.

All measured values and data contents can be logged, saved and exported via a USB stick using the instrument's data logger. The data logger also enables plausibility checks on GBAS/SCAT systems by graphically displaying the GPS position error with respect to a reference position and the pseudorange correction data in a single chart.

Time domain analysis with the R&S®EVS-K7 software option.



Measurement values in GBAS mode.


GBAS / SCAT
FREQ. [MHz]
117.9500
PPS STATUS
OK
Slot | Level [dBm] | DeltF [kHz] | SL ID | Stat ID | TLen bit | MsgB ID | TrS FEC | App FEC | Cycle [sec] | ElapT [sec]
0 A -42.6 -0.05 0 GLSF 1784 NORM OK OK 0.5 0.1
1 B -42.6 +0.05 0 GLSF 1824 NORM OK OK 0.5 0.1
2 C -42.6 +0.05 0 GLSF 1824 NORM OK OK 0.5 0.5
3 D -106.9 -.-- - ---- ---- ---- -- -- -.- -.-
4 E -106.1 -.-- - ---- ---- ---- -- -- -.- -.-
5 F -107.0 -.-- - ---- ---- ---- -- -- -.- -.-
6 G -106.1 -.-- - ---- ---- ---- -- -- -.- -.-
7 H -107.2 -.-- - ---- ---- ---- -- -- -.- -.-
LEVEL[dBm]
-42.556
-120 -100 -80 -60 -40 -20 0
Att.Mode
AUTO
Time Slot
0
SLOT VIEW
CH1: GBAS
CH2:
LIST: 22 15015
LIST:
CH: 1
REM
FULL

User-friendly design and application-specific extras

R&S®EVS-Z1 weather protection bag.

R&S®EVS-Z6 protective hard cover.

R&S®EVS-Z3 ILS (LLZ/GS)/VOR test antenna with R&S®EVS-Z4 carrying bag.

Stationary or mobile operation over a wide temperature range

Due to its energy-saving design, the R&S®EVS300 can provide up to ten hours of uninterrupted operation on a single battery charge. The rechargeable battery (R&S®EVS-B3 option) is securely positioned in a compartment on the rear of the instrument.

The R&S®EVS300 features a wide input voltage range of 10 V to 28 V so that it can be connected to onboard power supplies for use in vehicles and aircraft.

The R&S®EVS-Z5 DC/DC converter expands the input voltage range to between 10 V and 34 V and in addition allows the batteries (R&S®EVS-B3 option) to be recharged at voltages of less than 22 V.

Intuitive graphical user interface

The R&S®EVS300 features a large, easy-to-read display that provides plenty of space for viewing all relevant measurement values.

Softkeys located on the right-hand side of the screen allow the user to quickly select and modify the settings. The keys are individually matched to the different modes of operation such as ILS, VOR, MB and analysis in the time and frequency domain.

This flexible concept makes the R&S®EVS300 quick and simple to operate without having to provide the wide range of functions in a complex menu structure. As a result, user training is reduced to a minimum.

Simple remote control operation via standard interfaces

The R&S®EVS300 can be locally controlled via the pad on the front panel or remotely controlled.

It comes with an RS-232 serial interface and a TCP/IP Ethernet interface. These standard interfaces enable users to easily integrate the R&S®EVS300 into existing systems.

By using remote commands, recurring measurement tasks can be simplified by automating and controlling them via PC software. This is an important prerequisite for using the R&S®EVS300 in flight inspection systems or runway test vehicles.

The R&S®EVS300 has an integrated web server that allows the user to access the measurement results and change the settings without special software. All that is required is a PC with a standard web browser and network access to the R&S®EVS300.

Compact, lightweight and robust

The compact, lightweight R&S®EVS300 is also exceptionally well suited for mobile measurements in the field. Extras specially designed for the R&S®EVS300, such as a rugged transport case or a weather protection bag, simplify the user's daily measurement tasks.

The mechanical design of the R&S®EVS300 meets the requirements of the MIL-STD-810F standard with respect to vibration and shock.

Weather and transit protection for mobile operation

The R&S®EVS-Z1 weather protection bag has a transparent cover that allows the R&S®EVS300 to be used in the field even under adverse weather conditions. The front pocket can be used for transporting other accessories.

The R&S®EVS-Z6 protective hard cover is the ideal extra if the front panel needs to be protected, such as when transporting the R&S®EVS300.

ILS/VOR test antenna with carrying bag

The lightweight design of the R&S®EVS-Z3 ILS/VOR dipole antenna and its compact size make this antenna ideal for mobile measurements in the field.

This option comes with two sets of rods of different lengths to support the two frequency ranges. The telescope mast can be extended to 3.1 m.

The R&S®EVS-Z4 option for the R&S®EVS-Z3 ILS/VOR test antenna is a carrying bag for safely transporting all of the antenna elements and other accessories.

Accessories for conducting measurements in test vehicles or flight inspection aircraft

The R&S®EVS-Z5 DC/DC converter is recommended for situations in which spikes from the external power source need to be absorbed (e.g. on board flight inspection aircraft) or if the input voltage is less than 22 V and therefore does not supply enough voltage to recharge the battery (e.g. cigarette lighter in a runway test vehicle).

A DC buffer (R&S®EVS300-Z21) is also available for bridging voltage dips.

R&S®EVS-Z3 ILS (LLZ/GS)/VOR test antenna.

R&S®EVS-Z5 DC/DC converter.

Accurate on-site measurements

Thanks to its compact design, the R&S®EVS300 is easy to operate even in harsh environments or adverse weather conditions. At the same time, its measurement accuracy rivals top-of-the-line laboratory equipment.

The high contrast display is easy to read even in direct sunlight, allowing users to carry out problem-free measurements in the field.

The operating convenience of the R&S®EVS300 is second to none, making it the ideal choice for conducting e.g. glidepath measurements on the runway.

Ordering information

Designation	Type	Order No.
Base unit		
ILS/VOR Analyzer	R&S®EVS300	3544.4005.02
Options		
Second Signal Processing Unit	R&S®EVS-B1	5200.6625.02
Battery Pack	R&S®EVS-B3	5200.8240.02
Frequency Scan	R&S®EVS-K1	5200.6554.00
GPS Mode	R&S®EVS-K2	5200.6548.00
CRS/CLS Mode	R&S®EVS-K3	5200.9082.00
FFT Mode	R&S®EVS-K4	5201.5922.00
Support for Rohde&Schwarz power sensors	R&S®EVS-K5	5201.8644.02
DME Pulse Shape View	R&S®EVS-K6	5201.8650.02
Oscilloscope Mode	R&S®EVS-K7	5201.8667.02
R&S®EVS-K5 plus R&S®EVS-K6 Package	R&S®EVS-K8	5201.8696.02
GBAS Mode	R&S®EVS-K9	5202.8154.02
SCAT Mode	R&S®EVS-K10	5201.7783.00
Recommended extras		
Weather Protection Bag	R&S®EVS-Z1	5200.5812.00
Rugged Transport Case	R&S®EVS-Z2	5200.6525.00
ILS (LLZ/GS)/VOR Dipole Antenna	R&S®EVS-Z3	5200.6577.02
Carrying Bag for ILS (LLZ/GS)/VOR Dipole Antenna	R&S®EVS-Z4	5200.9999.00
DC/DC Converter (12 V to 24 V)	R&S®EVS-Z5	5200.6619.02
Protective Hard Cover	R&S®EVS-Z6	5201.7760.00
19" Adapter	R&S®EVS-Z7	5201.8680.00
DC Buffer	R&S®EVS-Z21	5201.9470.02
Service manual, English		3544.4486.22
Service manual, German		3544.4486.21
Documentation of Calibration Values	R&S®DCV-2	5201.4349.02
Accessories		
External power supply (100 V to 240 V)		5200.9118.02
User manual, English		3544.4486.12
User manual, German		3544.4486.11

Service options		
Extended Warranty, one year	R&S®WE1	Please contact your local Rohde&Schwarz sales office.
Extended Warranty, two years	R&S®WE2	
Extended Warranty, three years	R&S®WE3	
Extended Warranty, four years	R&S®WE4	
Extended Warranty with Calibration Coverage, one year	R&S®CW1	
Extended Warranty with Calibration Coverage, two years	R&S®CW2	
Extended Warranty with Calibration Coverage, three years	R&S®CW3	
Extended Warranty with Calibration Coverage, four years	R&S®CW4	

For data sheet, see 5213.6070.22 and www.rohde-schwarz.com

Your local Rohde&Schwarz expert will help you determine the optimum solution for your requirements.
To find your nearest Rohde&Schwarz representative, visit
www.sales.rohde-schwarz.com

Service that adds value

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

About Rohde&Schwarz

The Rohde&Schwarz electronics group is a leading supplier of solutions in the fields of test and measurement, broadcasting, secure communications, and radiomonitoring and radiolocation. Founded more than 80 years ago, this independent global company has an extensive sales network and is present in more than 70 countries.
The company is headquartered in Munich, Germany.

Sustainable product design

- Environmental compatibility and eco-footprint
- Energy efficiency and low emissions
- Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

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